Cont B1

means for accelerating a second data stream portion that is preceded by said first data stream portion.

B2

4. (amended) A method for avoiding overflow of a decoder buffer [containing a portion of new data stream and a portion of an old data stream,] comprising:

(a) determining a total amount of old data stream data that, if transmitted to said decoder buffer, would occupy said decoder buffer;

(b) adding, to said total amount, an amount of new data stream data to obtain a combined amount of data;

(c) testing if said combined amount of data would overflow said decoder buffer; and

(d) if overflow would occur, then causing a portion of the new data stream to be delayed by a delay amount corresponding to at least said overflow, if said portion were to be transmitted to said decoder buffer.

5. (amended) A method according to claim 4, wherein [said] the step (a) of determining is preceded by determining a maximum size of said decoder buffer;

B3

8. (amended) A method according to claim 4, further comprising:

prior to testing of step (c), subtracting, from said total amount, an amount of old data stream data that, if transmitted, would be decoded by [said] a decoder;

9. (amended) A method according to claim 4, wherein said delay amount of step (d) is a function of an amount of data stream data by which said decoder buffer is overflowed within said portion of the new data stream.

10. (amended) A method according to claim 4, wherein said delay amount of step (d) is a function of an amount of data stream data by which said decoder buffer is overflowed in a single instance of overflow within said portion of the new data stream.

B4

16. (amended) A method for detecting overflow of a data stream decoder during splicing of data stream portions including an old data stream portion and a new data stream portion, comprising:

(a) determining a first plurality of old data stream frame sizes and decoding times corresponding to old data stream frames of said old data stream portion, and storing said frame sizes and said decoding times in a splice-table;

cont
B4

(b) determining a maximum decoder buffer size;

(c) determining a new frame size and decoding time corresponding to a new data stream frame of the new data stream portion;

(d) determining an intermediate size by summing a second plurality of old data stream frame sizes stored in the splice table;

(e) determining a total size by adding to said intermediate size, the new data stream frame size; and

(f) testing for overflow by determining whether said total size exceeds said maximum decoder buffer size.

Sub C3

17. (amended) A method according to claim 16, wherein said second plurality of old data stream frame sizes of step (d) include all frames of the old data stream portion that will remain un-decoded when said new data stream frame will be received by the decoder, if the data stream portions are transmitted.

19. (amended) A method according to claim 16, further comprising:

B5

[(i)] if overflow is found in step (f), then causing a transmission time of a portion of new data stream data including said new data stream frame to be delayed.

20. (amended) A method for correcting overflow of a digitally encoded data stream decoder during splicing of data stream portions including an old data stream portion and a new data stream portion, comprising causing a delay of a scheduled transmission time of [a portion] at least a part of the new data stream data portion and an acceleration of a subsequent part of the new data stream portion.

B6 Sub D2

22. (amended) A method [according to claim 20, wherein said] comprising:

determining a delay [is] caused by re-scheduling transmission of [said portion] a part of new data stream data in a new data stream portion during splicing of data stream portions including an old data stream portion and the new data stream portion according to a formula:

Cont B6

(currently scheduled transmission time for said portion) + ((n packets x m bits/packet x multiplexer bit rate) / (data stream bit rate)),
wherein n indicates a number of packets by which transmission is to be delayed, and m indicates a number of bits in a packet of data stream data to be transmitted.

B7

27. (amended) A method according to claim 24, wherein determining said modified new data stream timing reference includes:

(i) determining a program clock reference of a first packet of said new data stream;

(ii) determining a delay between transmission of a first sequence header of said new data stream and a first decode time stamp [(“]DTS[”)] of a first frame of said new data stream;

(iii) determining a continuous DTS as a sum of said first DTS and an inter-frame delay; and

(iv) determining a new data stream real-time transmit time as said continuous DTS of step (iii) minus said delay of step (ii).

28. (amended) A method according to claim 24, wherein said aligning in step (b) sets a start time for transmitting [a] the portion of the new data stream that corresponds with a decoding time for decoding [a] the portion of the old data stream.

29. (amended) A method according to claim 24, wherein said aligning in step (b) sets a start time for a decoder buffer to begin receiving [a] the portion of the new data stream that corresponds with a decoding time for decoding [a] the portion of the old data stream.

B8

31. (amended) A method according to claim 24, wherein said determining of step (a) is preceded by

(i) determining [a] the splice-out point of the old data stream; and

(ii) determining [a] the splice-in point of the new data stream.

B9

33. (amended) A method according to claim 32, wherein said frame type is selected from a group consisting of B-frames and P-frames, and wherein said step of modifying comprises closing an open group of pictures [(“]GOP[“)].

B10

40. (amended) A method according to claim 39, wherein said first and second sources include source types selected from a group [consisting of] comprising a storage device, a satellite receiver, a cable receiver, a network, an audio source, a video source and an encoder.

B11

45. (amended) A method according to claim 24, wherein step (b) is followed by transmitting [a] the portion of the new data stream.

46. CANCEL

B12

47. (amended) A computer-readable storage medium storing program code for causing a computer to perform the steps of:

determining a new data stream pair to be spliced contemporaneously with another data stream pair; and

initiating program code for splicing said new data stream pair;

[(a)] determining a splice-out point within an old data stream;

[(b)] determining a splice-in point within a new data stream; and

[(c)] determining a new data stream real-time transmit start time.

48. CANCEL

Sub C7

B13

49. (amended) A computer-readable storage medium according to claim 47, wherein the step [(a)] of determining the splice-out point is preceded by:

creating at least one data storage structure for storing portions of said old and new data streams; and

storing portions of said old and new data streams in said at least one data storage structure.

B14

51. (amended) A method for splicing digitally encoded data streams, including an old data stream and a new data stream, comprising:

(a) receiving a user-selectable parameter indicating a portion of the old data stream within which a splice-out point is to be determined;

(b) assigning a splice-buffer for storing [an] the portion of the old data stream [portion] and a new data stream portion;

(c) directing the old data stream portion to said splice-buffer;

(d) determining said splice-out point;

(e) directing the new data stream portion to said splice-buffer;

(f) determining a splice-in point within the new data stream portion and, if an initial frame of the new data stream portion is dependent upon a frame that precedes the new data stream portion, then modifying the new data stream portion to remove said dependency;

(g) if, upon transmission, a decoder buffer would begin to receive the new data stream after said buffer finally receives [a] the portion of the old data stream, then aligning the new data stream with [said finally receiving] the finally received portion of the old data stream, and

Cont B14

(h) if, upon transmission, a decoder buffer would begin to receive the new data stream before said buffer finally receives [a] the portion of the old data stream, then aligning the new data stream with [said finally receiving] the finally received portion of the old data stream and modifying the portion of the old data stream.

Sub C8

52. (amended) A method according to claim 51, wherein said dependency of step (f) is an open GOP and wherein said modifying closes the open [group of pictures ("]GOP[")].

53. (amended) A method according to claim 51, further comprising:

[(j)] checking for overflow of said decoder buffer; and

[(k)] if overflow is found, then removing said overflow.

Sub D3

54. (amended) A splicer for splicing digitally encoded data streams, including an old data stream and a new data stream, comprising:

(a) means for determining, in accordance with a splice-out point of an old data stream and a splice-in point of a new data stream, a new data stream real-time transmit start time; and

(b) means for aligning the new data stream with the old data stream according to said new data stream real-time transmit time, said means for aligning both delaying and accelerating said new data stream when splicing said old data stream and said new data stream.

Sub C9

Cont B14

55. (amended) A method for preparing a digitally encoded data stream for splicing, comprising:

(a) determining a splice-in point of [the] a new data stream; and

(b) closing an initial open group of pictures [(“]GOP[“)] of the new data stream, if the new data stream includes an initial open GOP.

56. (amended) A splicer for splicing digitally encoded data streams including an old data stream and a new data stream, comprising:

(a) means for determining a splice-in point of the new data stream; and

(b) means for closing an open group of pictures [(“]GOP[“)] of the new data stream, if the new data stream includes [an] the open GOP.

B15

58. (amended)A method according to claim 57, wherein [a] said splice-out point is determined as being immediately prior to a sequence header.

59. (amended)A method according to claim 57, wherein [a] said splice-out point is determined as being immediately prior to a first occurring one of a group of pictures [(“]GOP[“)] header, an I-frame and a P-frame.

60. (amended) A method according to claim 51, wherein said step of determining [a] said splice-in point comprises:

finding a decode time stamp (“DTS”) for a frame of the new data stream, said frame being included within a group of pictures [(“]GOP[“)] of the new data stream;

finding a corresponding presentation time stamp for said frame of the new data stream; and

if said frame of the new data stream is other than an I-frame, then closing said GOP.

61. (amended) A method according to claim 60, wherein said frame is [an] the initial frame of the new data stream.

B16 Sub C10

64. (amended) A method according to claim 63, wherein step (b) is accomplished by deleting another frame within said portion that precedes said independently decodable frame.

[illegible] B16

65. (amended) A method for closing an open group of pictures GOP of a digitally encoded data stream, said GOP including a plurality of frames, comprising:

(a) determining a first I-frame within said GOP;

(b) determining, within said GOP, a largest decode time stamp DTS of all of said frames that precede said I-frame;

(c) deleting all frames within said GOP that precede said I-frame;

(d) modifying temporal references for at least one remaining frame within said GOP; and

(e) replacing a DTS of said I-frame with said largest DTS of step (b).

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67. CANCEL

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17 B

68. (amended) A method for aligning a splice-out portion of a digitally encoded old data stream with a splice-in portion of a digitally encoded new data stream comprising the step of finding a new data stream real-time transmit time [according to claim 67] wherein said step of finding includes:

(a) determining a program clock reference ("PCR") of a first packet of said new data stream;

(b) determining a delta-period between transmission of a first sequence header of said new data stream and a first decode time stamp ("DTS") of a first frame of said new data stream, if said new data stream is transmitted;

(c) determining a continuous DTS as a sum of said first DTS and an inter-frame delay; and

(d) determining said new data stream real-time transmit time as a difference between said continuous DTS and said delta-period.

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18 B

71. (amended) A method for aligning a splice-out portion of a digitally encoded old data stream with a splice-in portion of a digitally encoded new data stream, comprising the step of setting a start of receipt time of said new data stream at which, if said new data stream is transmitted, then said new data stream will begin to be received by a decoder in alignment with a decoding time for said splice-out portion of said old data stream, and wherein said step of setting includes:

if said new data stream, upon transmission, would begin to be received by the decoder after the decoder has received all of said splice-out portion, then setting a transmission acceleration parameter for said new data stream.

Cont B18

72. A method according to claim 71 wherein said step of setting includes:

if, upon transmission of said old and new data streams, said new data stream would begin to be received by a decoder before the decoder would have received all of said splice-out portion, then setting a transmission delay parameter for said new data stream.

B19

74. (amended) A method according to claim 73 wherein said number of null packets equals a number of data packets that, without [said] inserting the null packets, would be received by [a] the decoder before the decoder has received all of said splice-out portion, if the new data stream is transmitted.

75. CANCEL

B20

77. (amended) A method according to claim 76 wherein said number of null packets equals a number of data packets that, without said deleting, would be received by [a] the decoder after the decoder has received all of said splice-out portion, if the new data stream is transmitted.

78. (amended) A method for aligning a splice-out portion of a digitally encoded old data stream with a splice-in portion of a digitally encoded new data stream, said splice-out portion and said splice-in portion each comprising a plurality of packets, which comprises:

(a) parsing said splice-out portion for a program clock reference ("PCR") of a last packet of said splice-out portion to be transmitted;

(b) parsing said splice-in portion for a first sequence header and a first decode time stamp ("DTS") of a first frame of said new data stream;

(c) determining a [continuous DTS] real-time transmit time of said new data stream;

(d) if the splice-out PCR of step (a) is less than the real-time transmit time of step (c), then storing a value indicating a total number of null packets which, when transmitted prior to said splice-in portion, will cause transmission of said splice-in portion to begin at substantially a same time as decoding of said splice-out portion; and

(e) if said splice-out portion PCR of step (a) is greater than said real-time transmit time of step (c), then storing a total number of null packets which, when deleted from said splice-in portion, will approximate a condition in which the splice-out portion PCR equals the real-time transmit time.